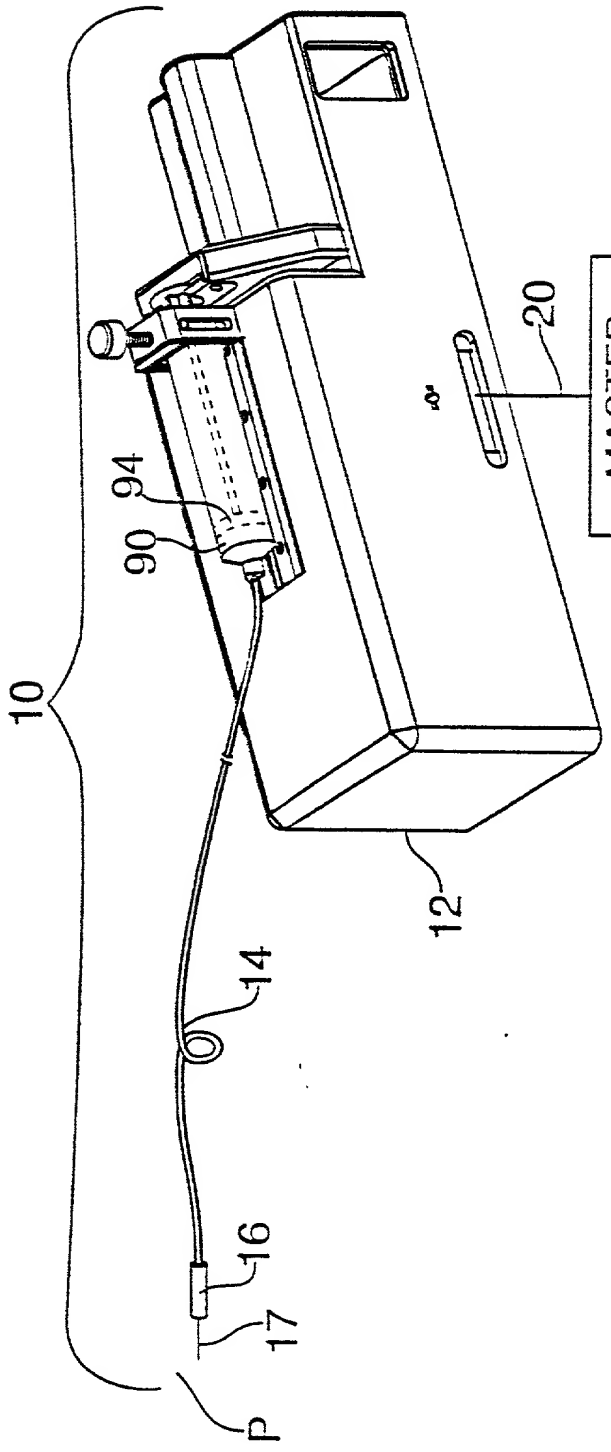


FIG. 1

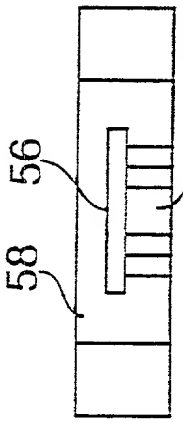


FIG. 7A

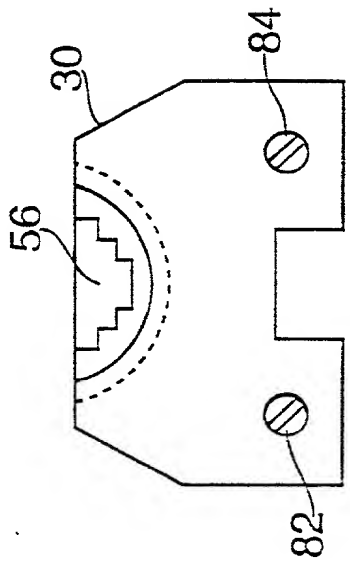


FIG. 7B

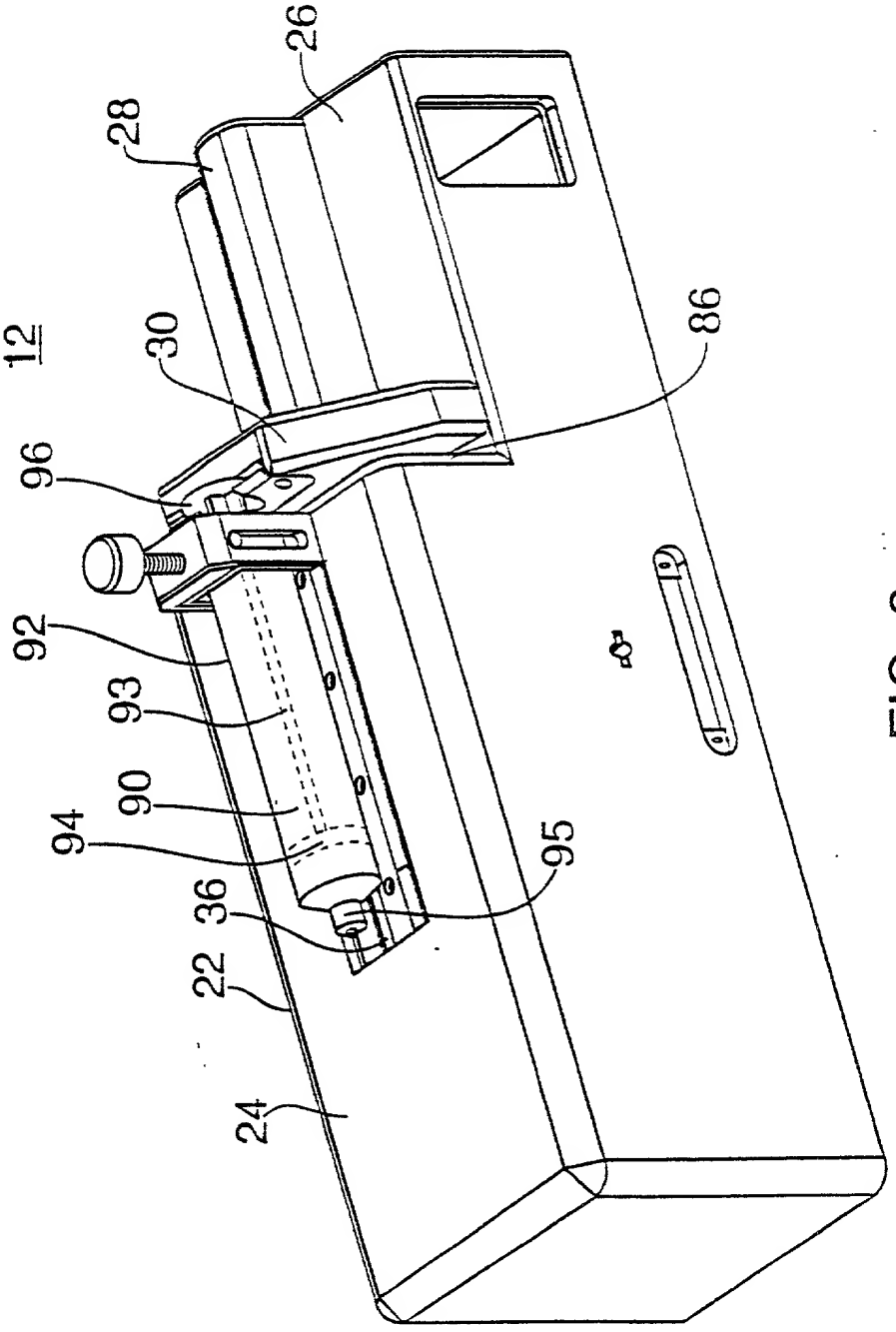


FIG. 2

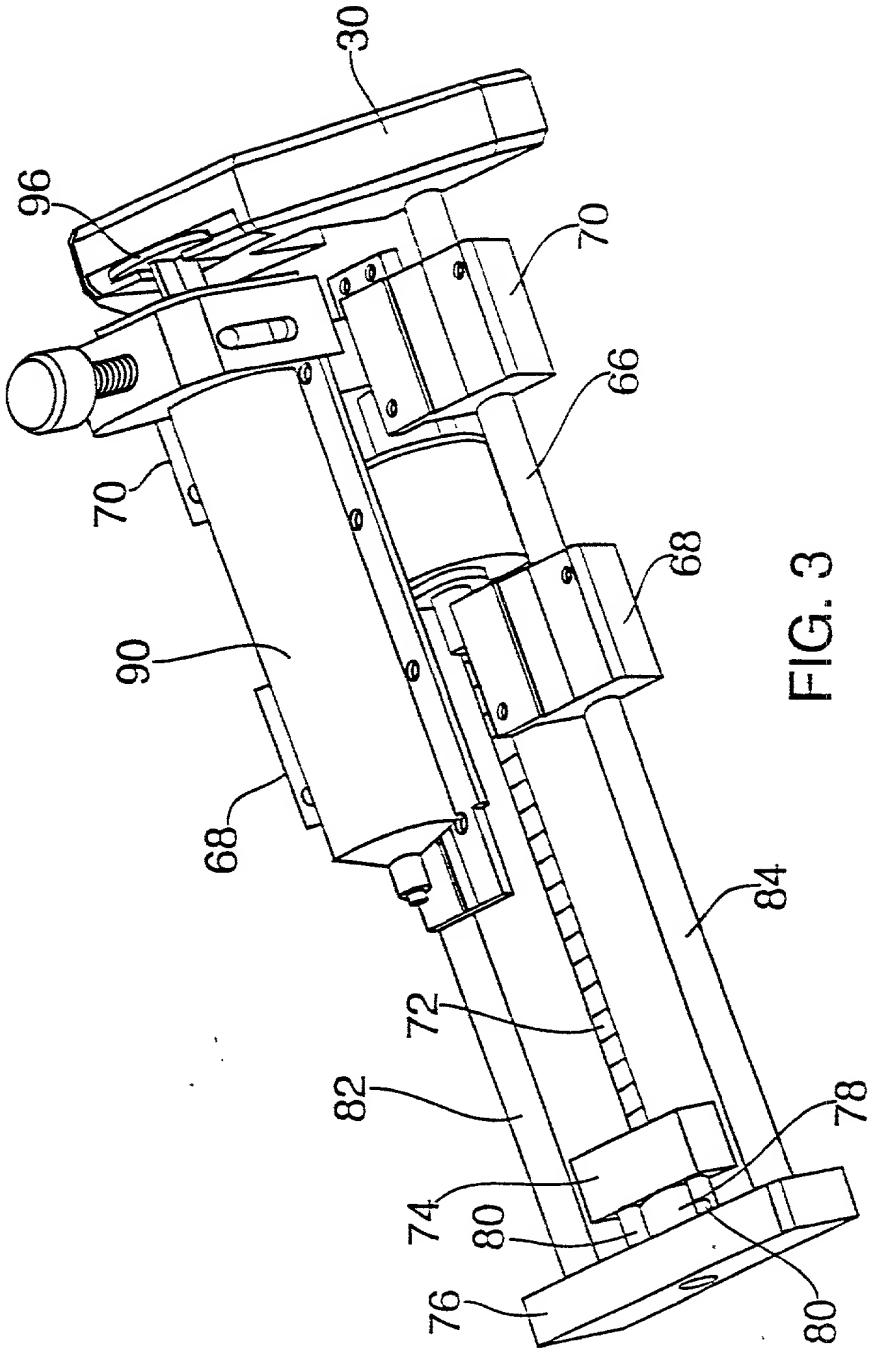


FIG. 3

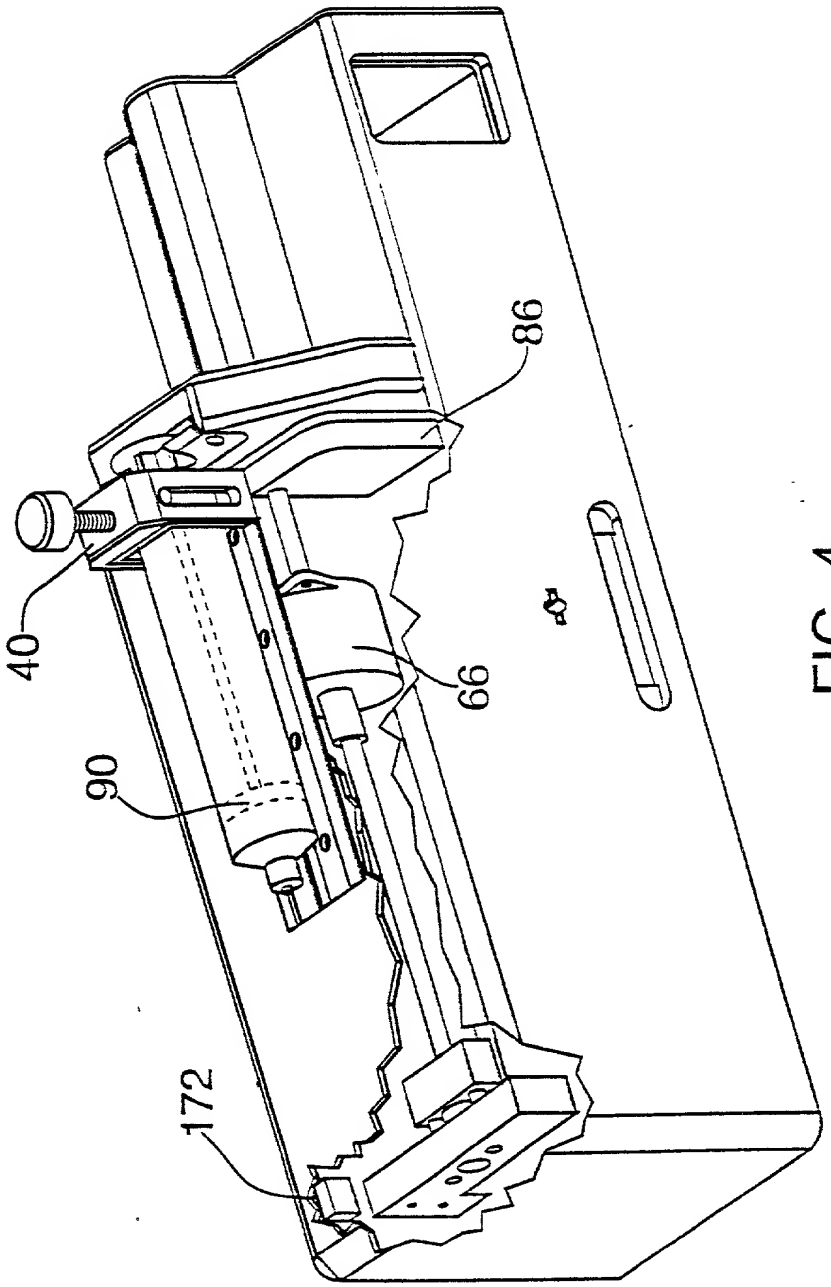


FIG. 4

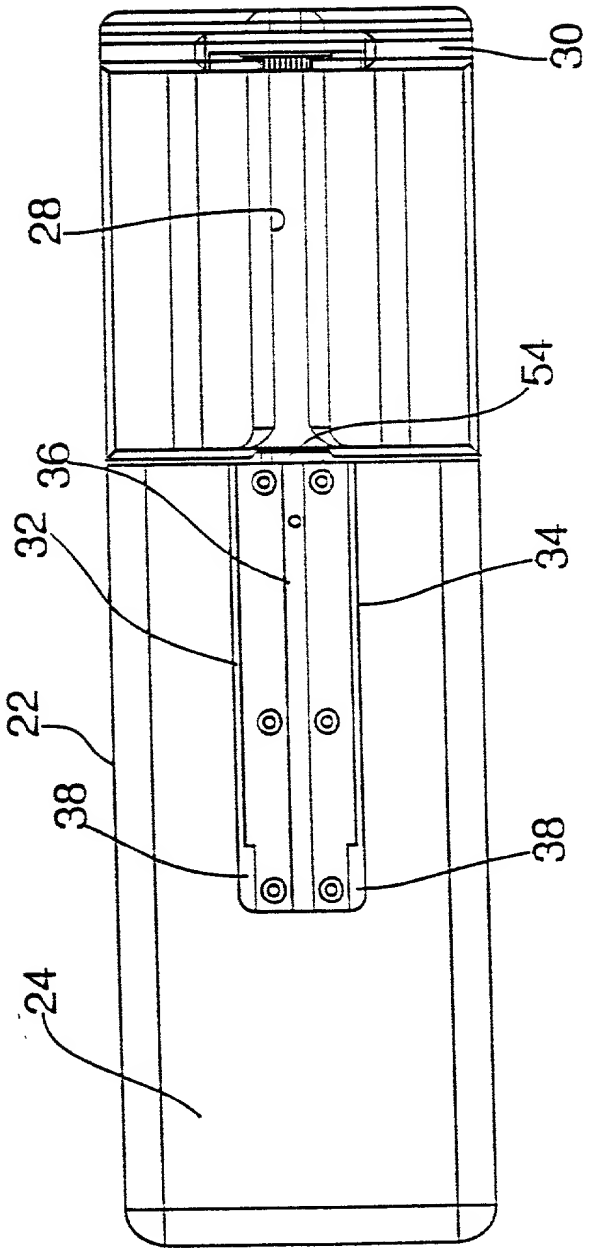


FIG. 5A

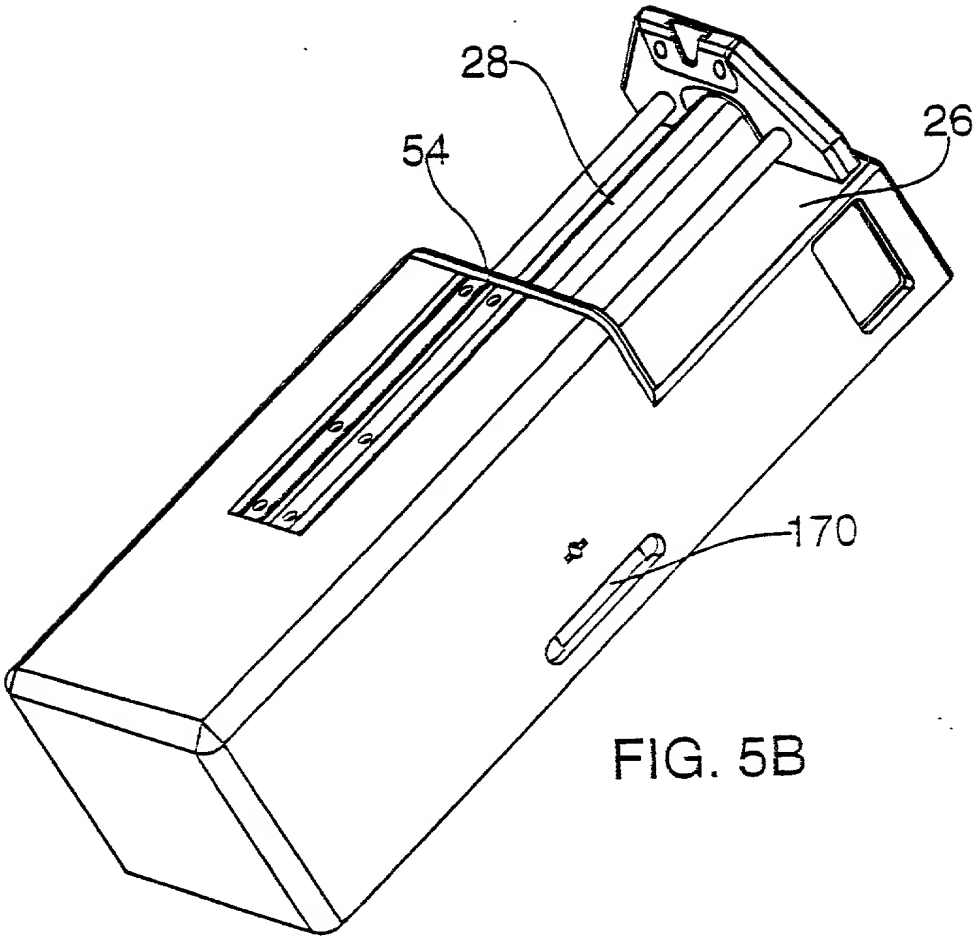

28
26
54
170

FIG. 5B

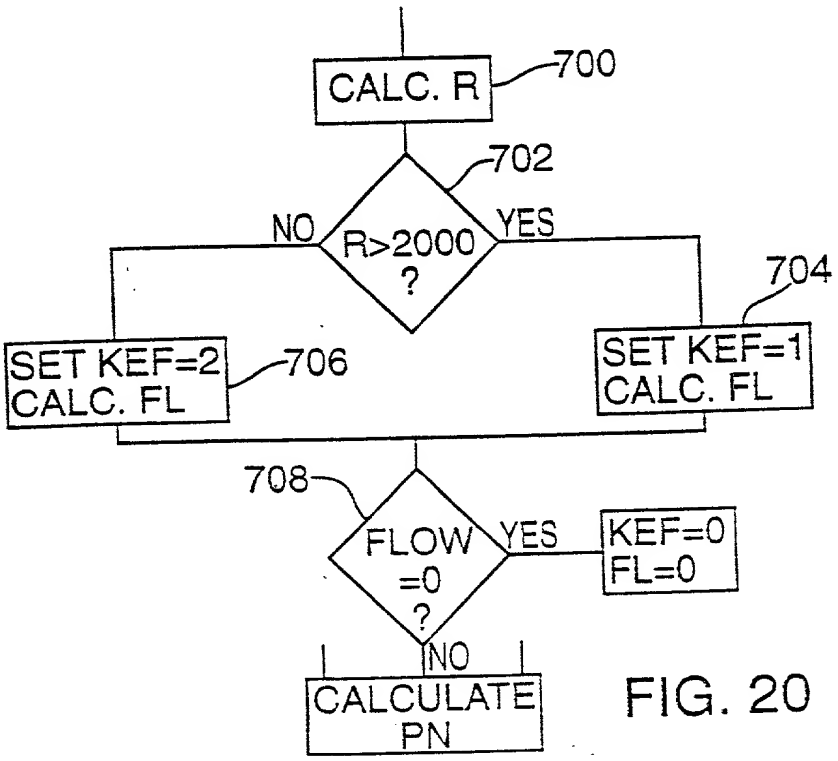

CALC. R
700
702
NO
R>2000 ?
YES
704
SET KEF=2
CALC. FL
706
SET KEF=1
CALC. FL
708
FLOW =0 ?
YES
KEF=0
FL=0
NO
CALCULATE PN

FIG. 20

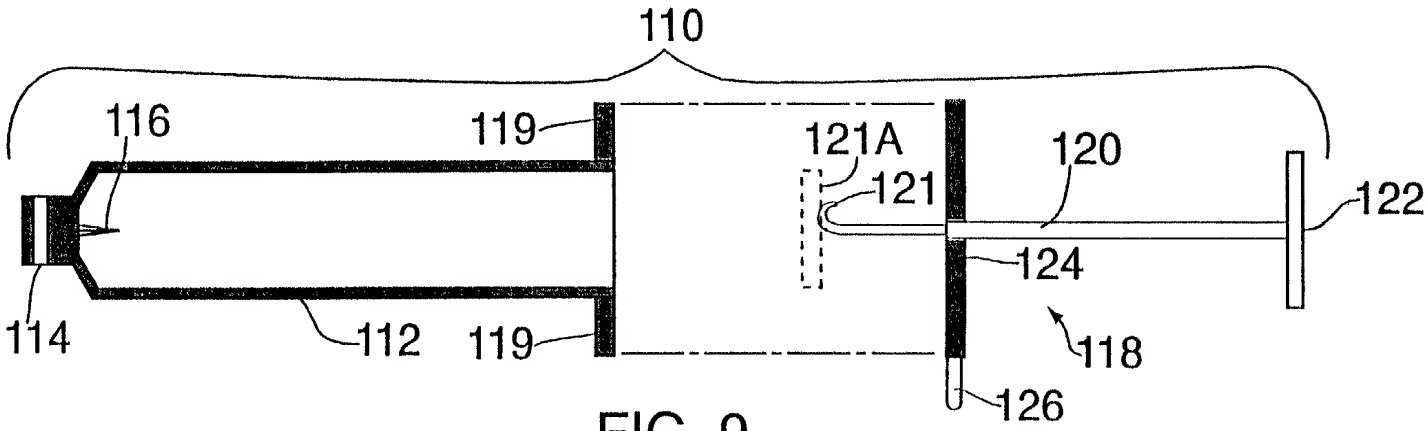


FIG. 9

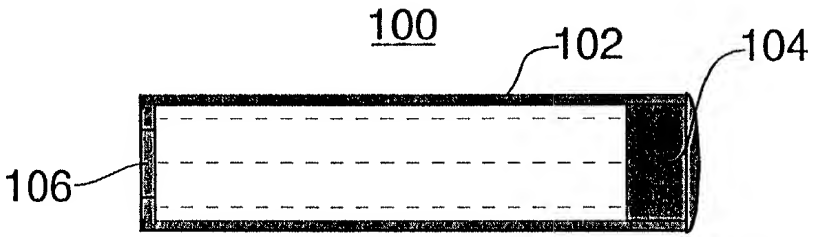


FIG. 8
(PRIOR ART)

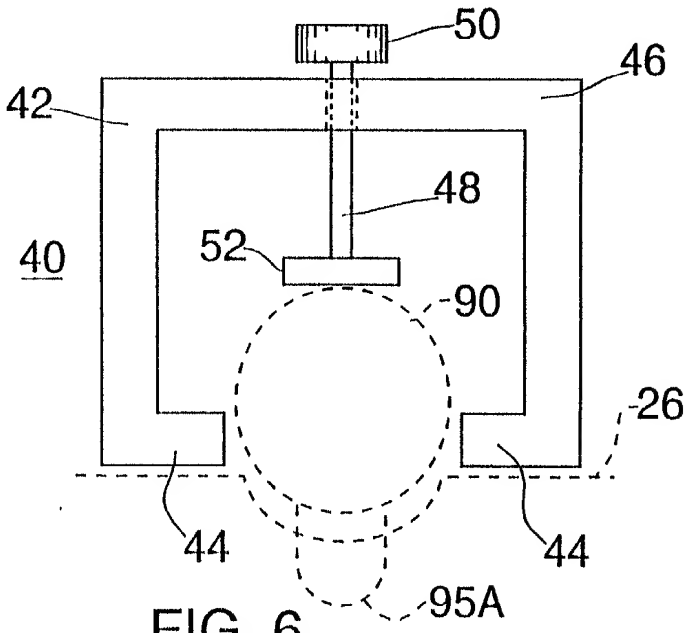


FIG. 6

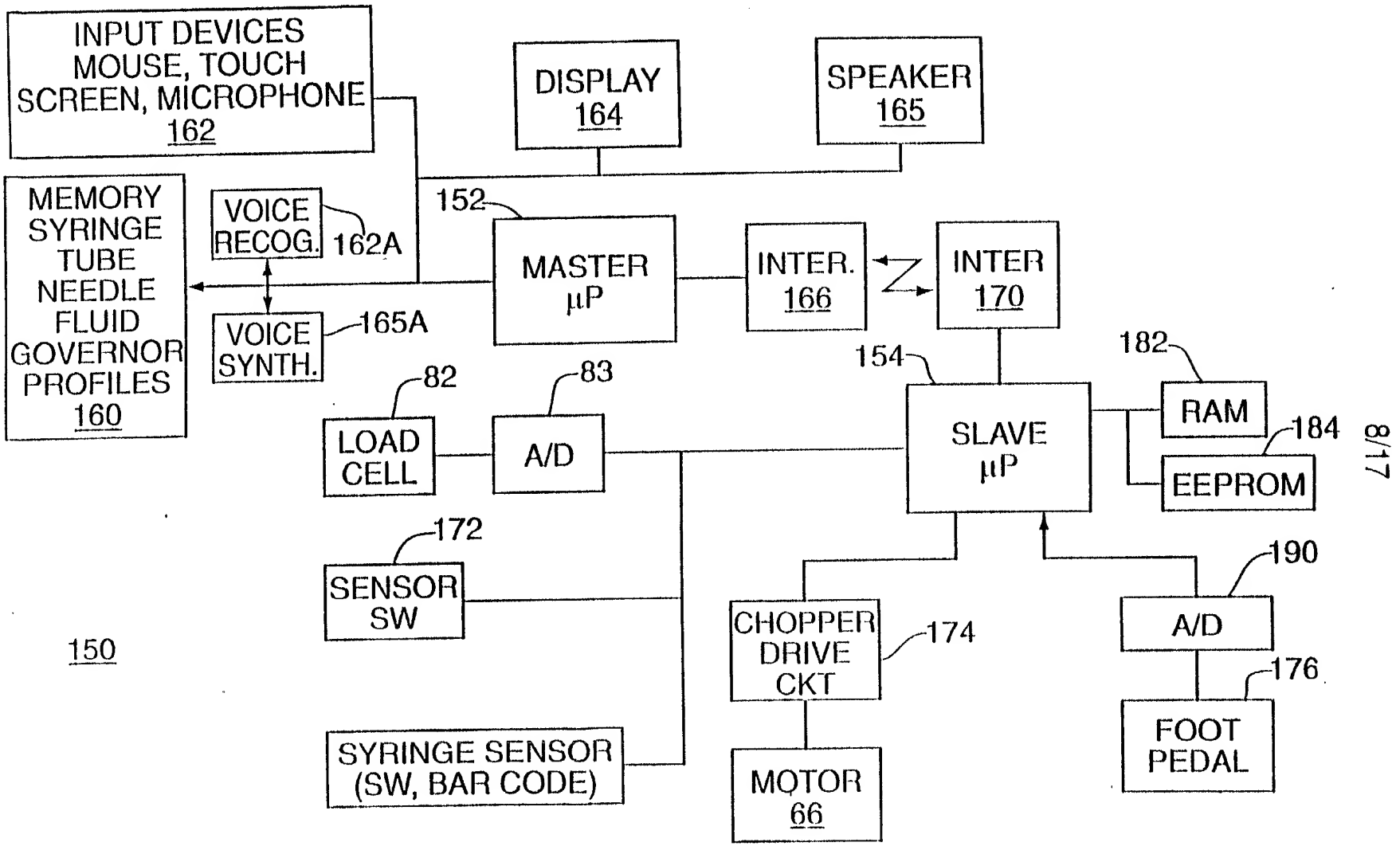

INPUT DEVICES
MOUSE, TOUCH
SCREEN, MICROPHONE
162
DISPLAY
164
SPEAKER
165
MEMORY
SYRINGE
TUBE
NEEDLE
FLUID
GOVERNOR
PROFILES
160
VOICE
RECOG.
162A
VOICE
SYNTH.
165A
152
MASTER
µP
INTER.
166
INTER
170
154
182
RAM
184
EEPROM
SLAVE
µP
82
LOAD
CELL
83
A/D
172
SENSOR
SW
SYRINGE SENSOR
(SW, BAR CODE)
CHOPPER
DRIVE
CKT
174
MOTOR
66
190
A/D
176
FOOT
PEDAL
150

FIG. 10

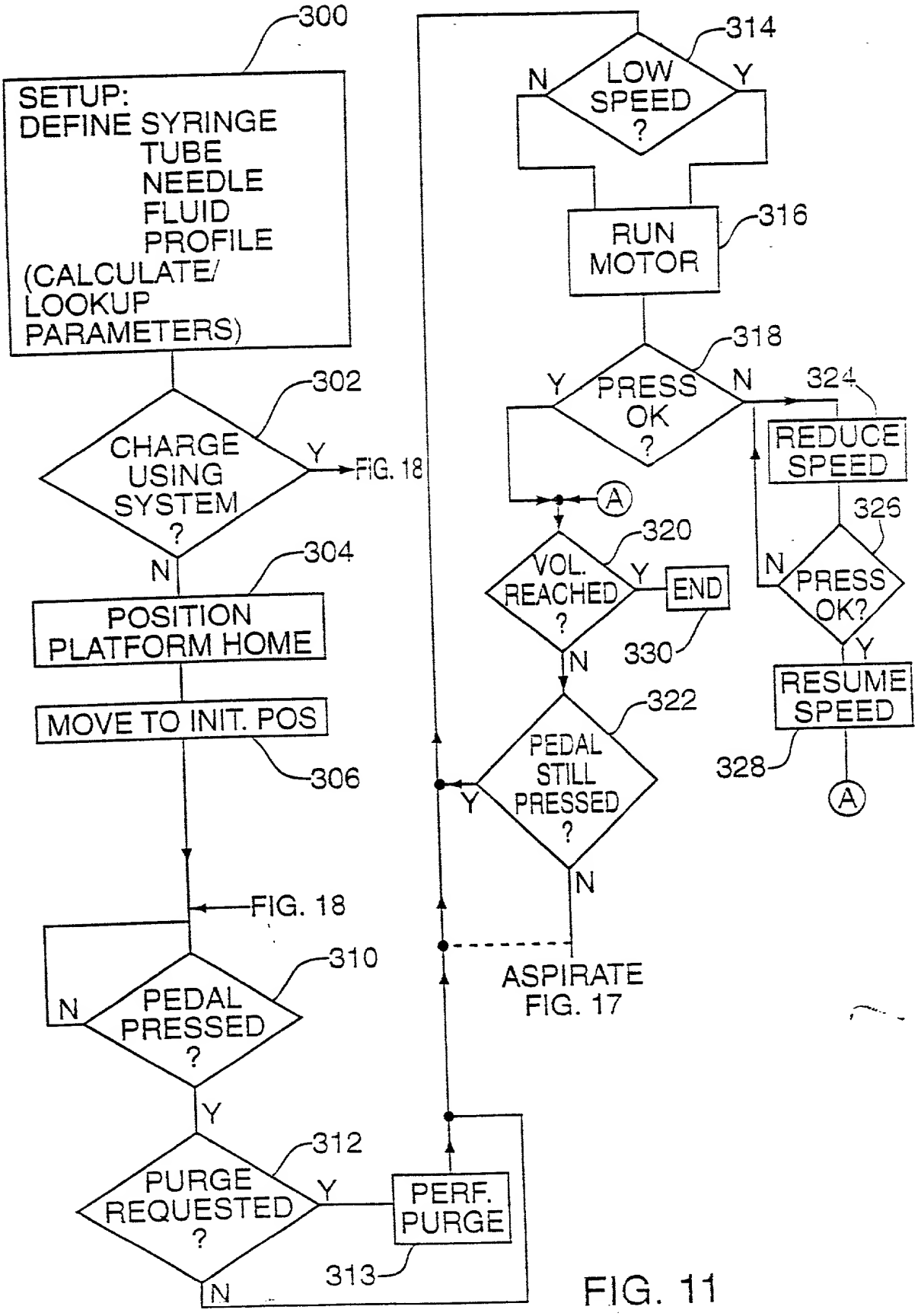
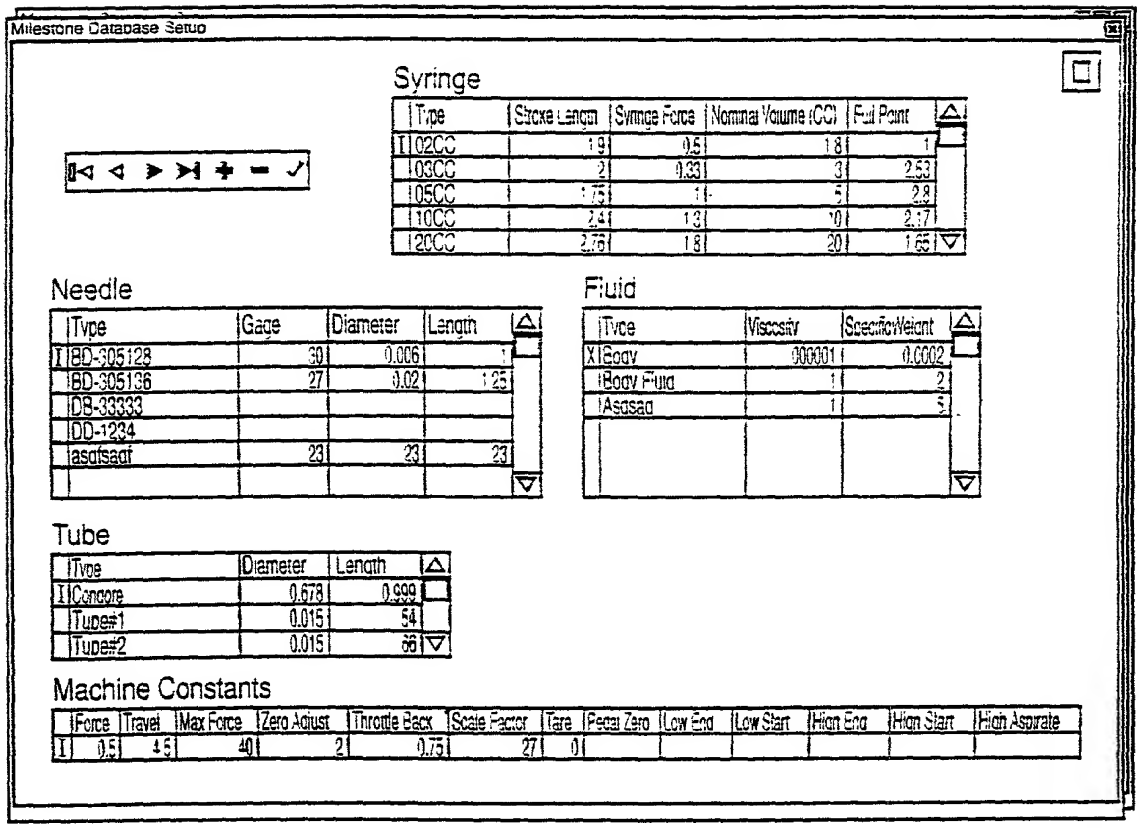

300
SETUP:
DEFINE SYRINGE
TUBE
NEEDLE
FLUID
PROFILE
(CALCULATE/
LOOKUP
PARAMETERS)
302
CHARGE USING SYSTEM ?
Y
FIG. 18
N
304
POSITION PLATFORM HOME
MOVE TO INIT. POS
306
FIG. 18
310
N
PEDAL PRESSED ?
Y
312
PURGE REQUESTED ?
Y
PERF. PURGE
313
N
314
N
LOW SPEED ?
Y
RUN MOTOR
316
318
Y
PRESS OK ?
N
324
REDUCE SPEED
A
320
VOL. REACHED ?
Y
END
330
N
322
Y
PEDAL STILL PRESSED ?
N
ASPIRATE
FIG. 17
326
N
PRESS OK?
Y
RESUME SPEED
328
A

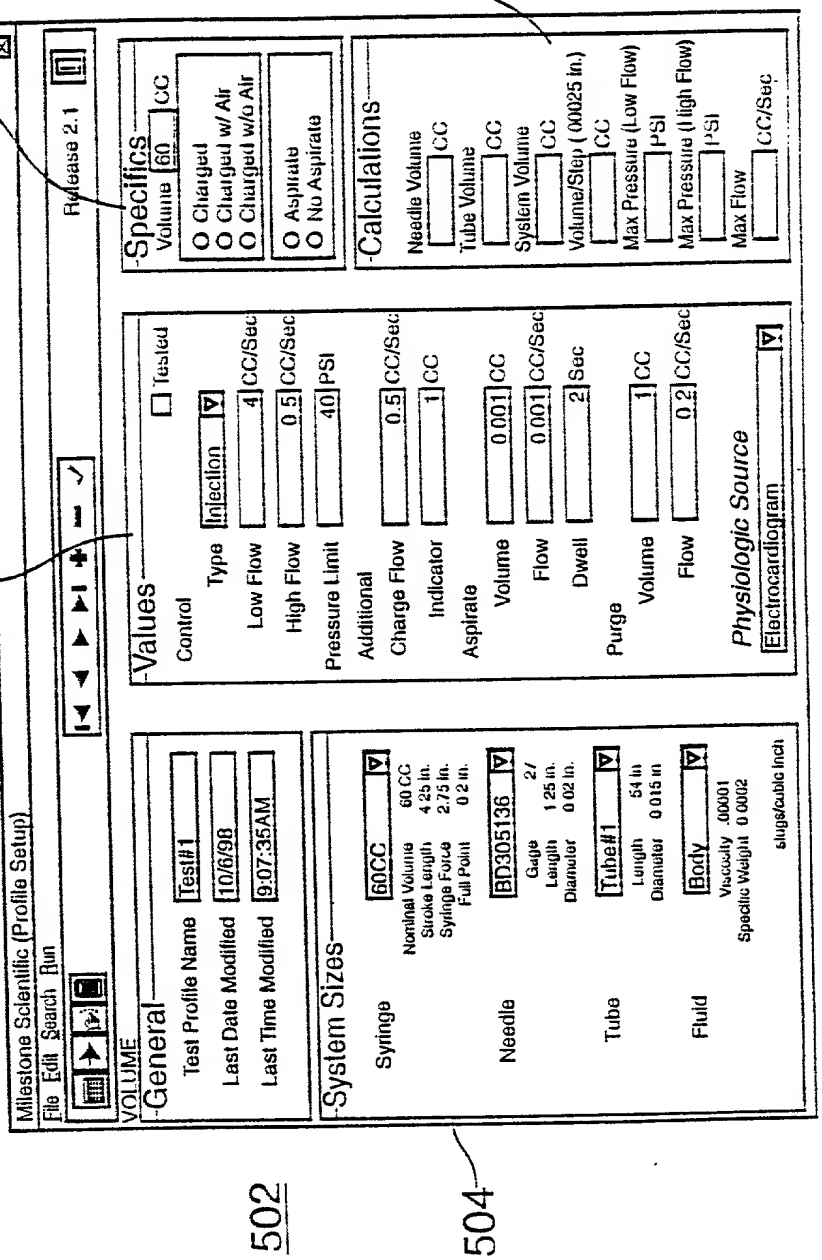
FIG. 11



Machine Profile Setup Screen
Set Values for Components of Delivery System
Setup Variable for Machine

FIG. 12A

5,925,017 - 07/20/99



502

504

506

508

510

FIG. 12B

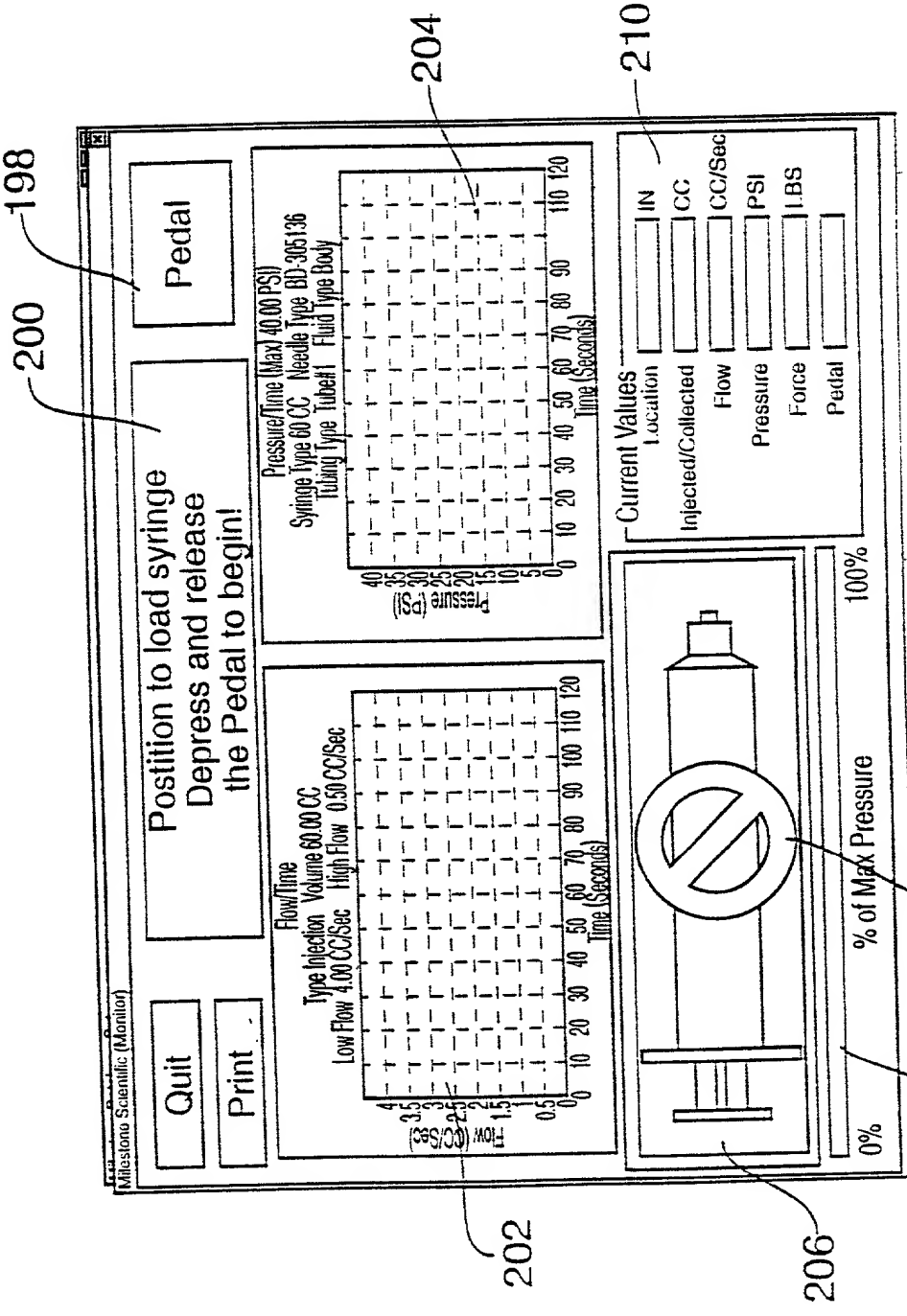

198
200
204
210
Milestone Scientific (Monitor)
Quit
Print
Pedal
Position to load syringe
Depress and release
the Pedal to begin!
Flow/Time
Type Injection Volume 60.00 CC
Low Flow 4.00 CC/Sec High Flow 0.50 CC/Sec
Time (Seconds)
Pressure/Time (Max) 40.00 PSI)
Syringe Type 60 CC Needle Type BD-305136
Tubing Type Tube#1 Fluid Type Body
Time (Seconds)
Current Values
Location
Injected/Collected
Flow
Pressure
Force
Pedal
IN
CC
CC/Sec
PSI
LBS
% of Max Pressure
0%
100%
202
206
208
212

FIG. 13

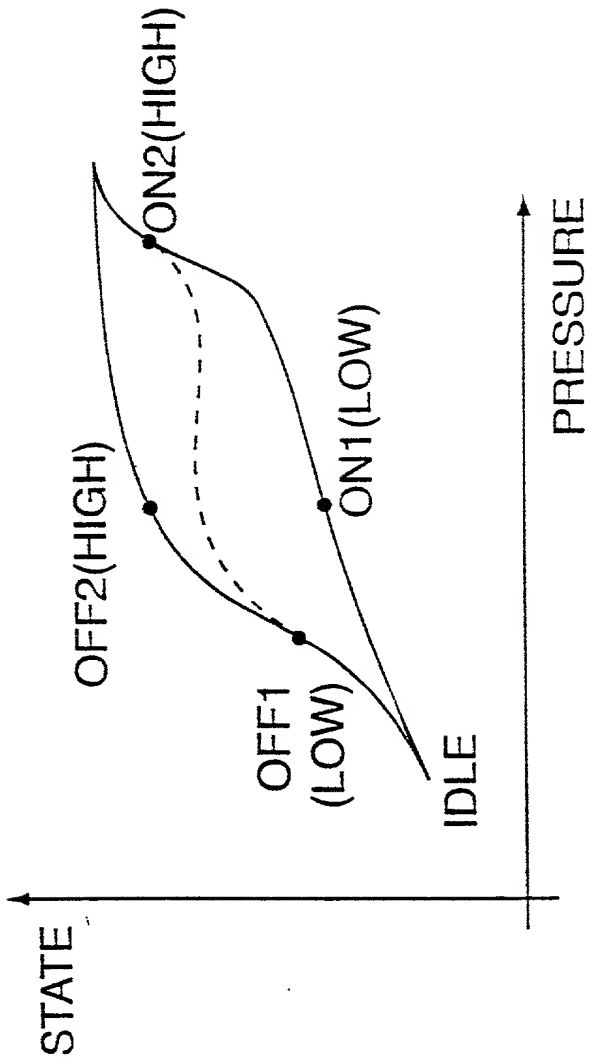


FIG. 14

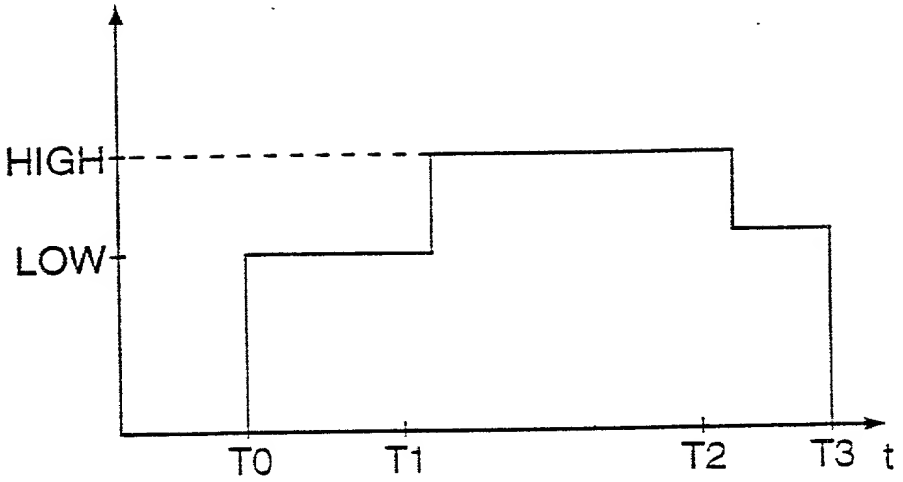


FIG. 15A

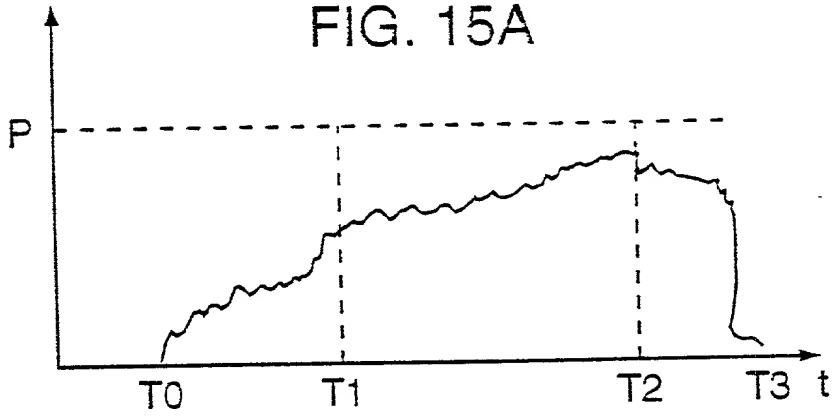


FIG. 15B

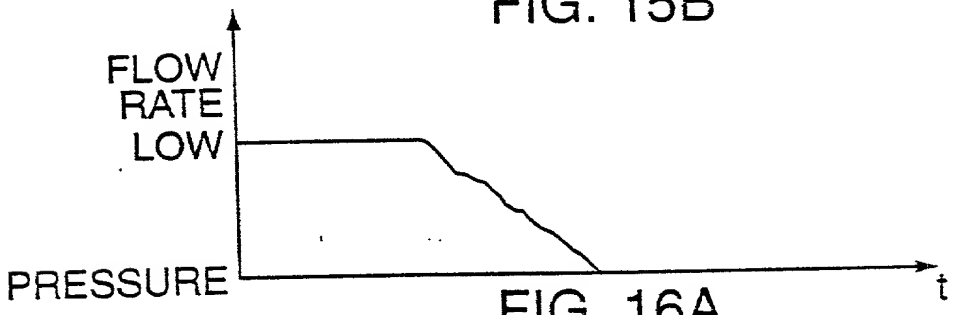


FIG. 16A

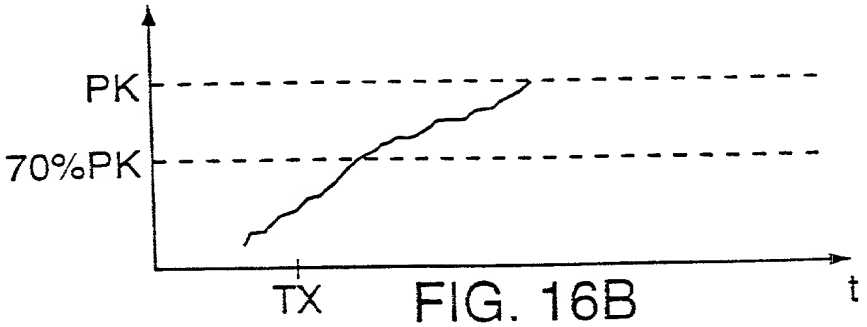


FIG. 16B

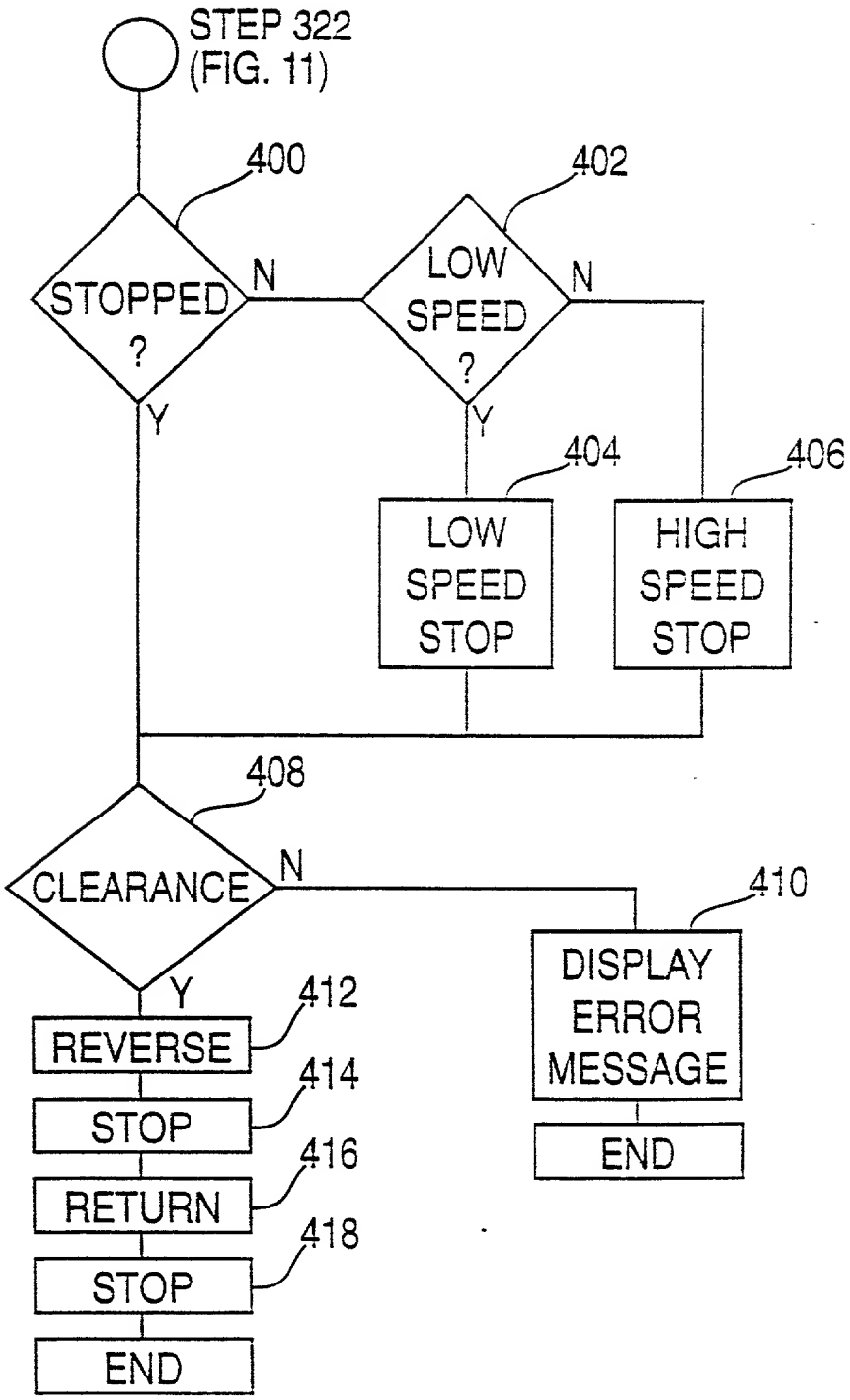

STEP 322
(FIG. 11)
400
STOPPED ?
N
Y
402
LOW SPEED ?
N
Y
404
LOW SPEED STOP
406
HIGH SPEED STOP
408
CLEARANCE
N
Y
410
DISPLAY ERROR MESSAGE
END
412
REVERSE
414
STOP
416
RETURN
418
STOP
END

FIG. 17

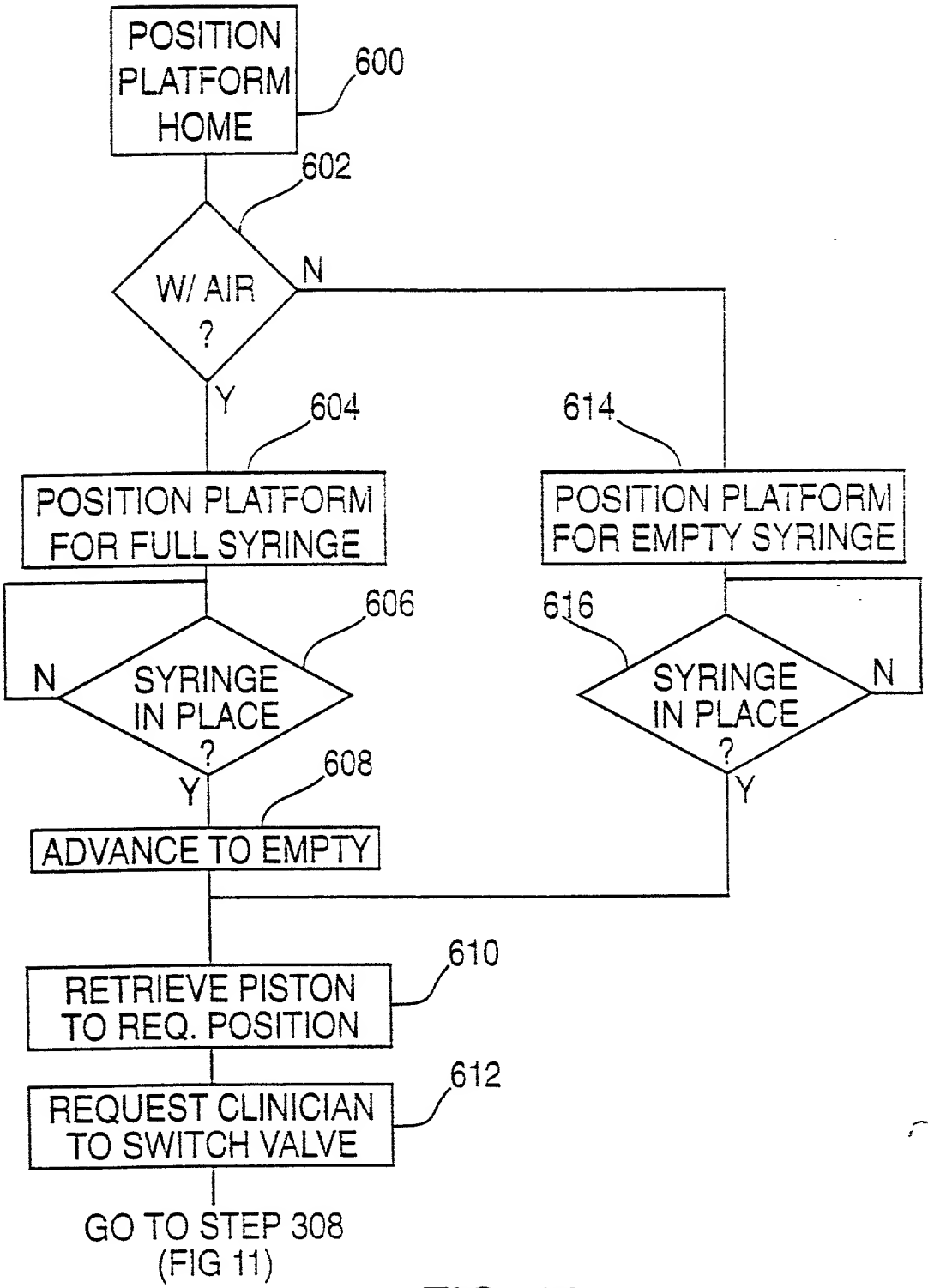

POSITION PLATFORM HOME
600
602
W/ AIR ?
N
Y
604
614
POSITION PLATFORM FOR FULL SYRINGE
POSITION PLATFORM FOR EMPTY SYRINGE
606
616
N
SYRINGE IN PLACE ?
SYRINGE IN PLACE ?
N
Y
Y
608
ADVANCE TO EMPTY
610
RETRIEVE PISTON TO REQ. POSITION
612
REQUEST CLINICIAN TO SWITCH VALVE
GO TO STEP 308 (FIG 11)

FIG. 18

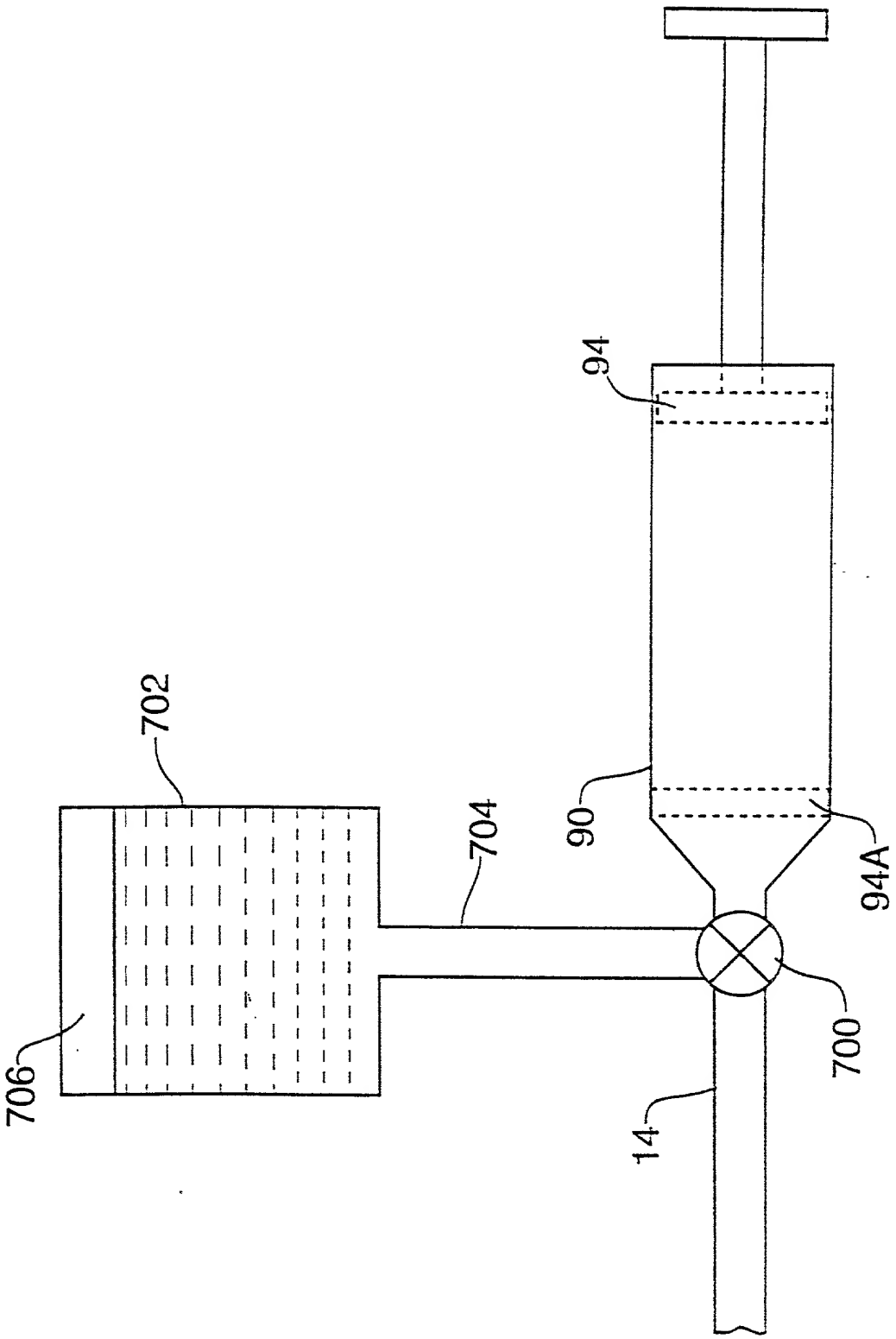


FIG. 19